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For: PHOTONIC BUOY

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1 A photonic buoy comprising:
2 a lengthy hull including a ballast portion which resides below the
3 waterline and a top portion which is disposed above the waterline;
4 an optical bench at the top portion of the hull configured to provide
5 a panoramic view of the horizon; and
6 a transmission cable extending from the optical bench for
7 transmitting video signals to a remote location.

1 2. The photonic buoy of claim 1 in which the optical bench includes a
2 conical mirror inside the top portion of the hull surrounded by a transparent wall and a
3 vertically oriented imager aimed at the conical mirror.

1 3. The photonic buoy of claim 1 in which the optical bench includes a
2 conical prism sealed with respect to the top of the hull and a vertically oriented imager in
3 the hull aimed at the conical prism.

1 4. The photonic buoy of claims 2 or 3 in which the imager is a CCD camera.

1 5. The photonic buoy of claims 2 or 3 in which the imager is an infrared
2 camera.

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1 6. The photonic buoy of claim 1 further including a sensor in the hull which
2 detects the attitude of the buoy.

1 7. The photonic buoy of claims 2 or 3 in which the transmission cable
2 includes optical fibers and further including a converter within the buoy responsive to the
3 imager which converts image data into optical data for transmission over the optical
4 fibers of the transmission cable.

1 8. The photonic buoy of claim 1 in which the hull includes a self scuttling
2 plug therein.

1 9. The photonic buoy of claim 1 in which the hull has a diameter compatible
2 with a launcher of a submarine.

1 10. The photonic buoy of claim 1 in which the ballast portion includes a
2 weight disposed therein.

1 11. The photonic buoy of claim 1 in which the ballast portion includes a spool
2 of the transmission cable.

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1 12. A photonic buoy system comprising:
2 a buoy including a lengthy hull with a ballast portion which resides
3 below the waterline and a top portion which is disposed above the waterline;
4 an optical bench at the top portion of the hull configured to provide
5 a panoramic view of the horizon;
6 a workstation remote from the hull, responsive to the optical
7 bench, and including a display and image stabilization circuitry for presenting a
8 composite image of the horizon on the display; and
9 a transmission cable interconnecting the optical bench and the
10 workstation.

1 13. The photonic buoy system of claim 12 in which the ballast portion of the
2 hull includes a first spool of transmission cable.

1 14. The photonic buoy system of claim 12 in which the workstation is located
2 on board a submarine which includes a second spool of the transmission cable.

1 15. The photonic buoy system of claim 12 in which the image stabilization
2 circuitry includes frame rate image processing software and hardware.

1 16. The photonic buoy system of claim 12 in which the optical bench includes
2 a conical mirror inside the top portion of the hull surrounded by a transparent wall and a
3 vertically oriented imager aimed at the conical mirror.

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1 17. The photonic buoy system of claim 12 in which the optical bench includes
2 a conical prism sealed with respect to the top of the hull and a vertically oriented imager
3 in the hull aimed at the conical prism.

1 18. The photonic buoy system of claims 16 or 17 in which the imager is a
2 CCD camera.

1 19. The photonic buoy system of claims 16 or 17 in which the imager is an
2 infrared camera.

1 20. The photonic buoy system of claim 12 further including a sensor in the
2 hull which detects the attitude of the buoy.

1 21. The photonic buoy system of claims 16 or 17 in which the transmission
2 cable includes optical fibers and further including a converter in the buoy responsive to
3 the imager which converts image data into optical data for transmission over the optical
4 fibers of the transmission cable.

1 22. The photonic buoy system of claim 12 in which the hull includes a self
2 scuttling plug therein.

1 23. The photonic buoy system of claim 12 in which the hull has a diameter
2 compatible with a launcher of a submarine.

- 1 24. The photonic buoy system of claim 12 in which the ballast portion
2 includes a weight disposed therein.

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1 25. A photonic buoy comprising:
2 a lengthy hull including a ballast portion which resides below the
3 waterline and a top portion which is disposed above the waterline;
4 a vertically oriented imager in the hull;
5 an optical element at the top portion of the hull configured to direct
6 a panoramic view of the horizon to the vertically oriented imager; and
7 a transmission cable for transmitting video signals from the
8 vertically oriented imager to a remote location.

1 26. The photonic buoy of claim 25 in which the optical element is a conical
2 mirror.

1 27. The photonic buoy of claim 25 in which the optical element is a conical
2 prism.

1 28. The photonic buoy of claim 25 in which the imager is a CCD camera.

1 29. The photonic buoy of claim 25 in which the imager is an infrared camera.

1 30. The photonic buoy of claim 25 further including a sensor in the hull which
2 detects the attitude of the buoy.

1 31. The photonic buoy of claim 25 in which the transmission cable includes
2 optical fibers and further including a converter in the buoy responsive to the imager
3 which converts image data into optical data for transmission over the optical fibers of the
4 transmission cable.

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- 1 32. A photonic buoy comprising:
- 2 a lengthy hull including a lower ballast portion which resides
- 3 below the waterline and a top portion which is disposed above the waterline;
- 4 an optical bench at the top portion of the hull configured to provide
- 5 a panoramic view of the horizon, the optical bench including a conical mirror inside the
- 6 top portion of the hull surrounded by a transparent wall and an imager aimed at the
- 7 conical mirror.

1 33. A photonic buoy comprising:
2 a lengthy hull including a lower ballast portion which resides below the
3 waterline and a top portion which is disposed above the waterline;
4 an optical bench at the top portion of the hull configured to provide a
5 panoramic view of the horizon, the optical bench including a conical prism sealed with
6 respect to the top of the hull and an imager in the hull aimed at the conical prism.

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